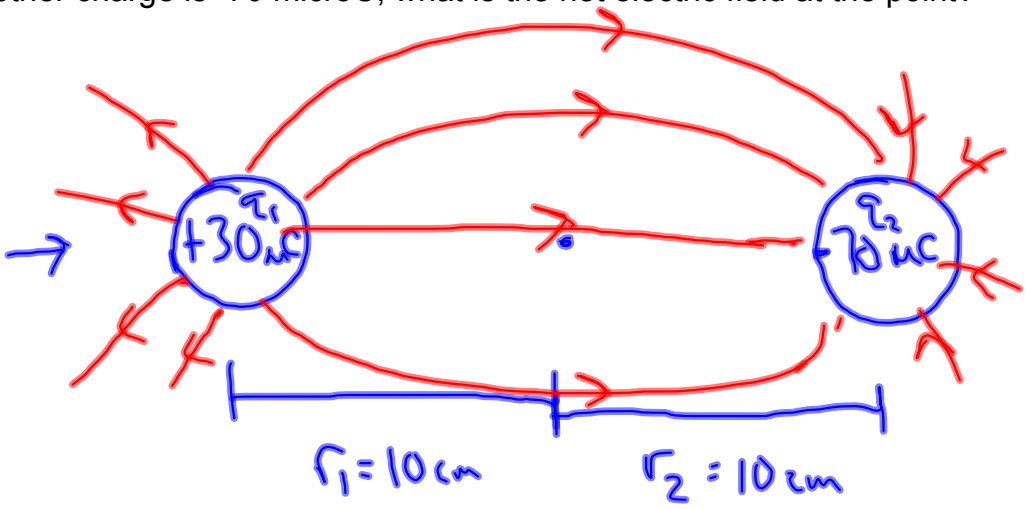
Electric Field Practice Problems 1st Block 11.8.11

Two charges are separated by a distance of 20 cm, and there is a point halfway between them at which we want to measure the electric field. If one charge is +30 microC and the other charge is -70 microC, what is the net electric field at the point?



$$\Sigma \vec{E}_{net} = \vec{E}_1 + \vec{E}_2$$

$$= +\frac{k|q_1|}{r_1^2} + \frac{k|q_2|}{r_2^2}$$

$$= \frac{(8.99E9\ N\cdot m^2/C^2)(30E\text{-}6\ C)}{(.10\ m)^2} + \frac{(8.99E9\ N\cdot m^2/C^2)(70E\text{-}6\ C)}{(.1\ m)^2}$$

$$= 8.99E7\ N/C$$

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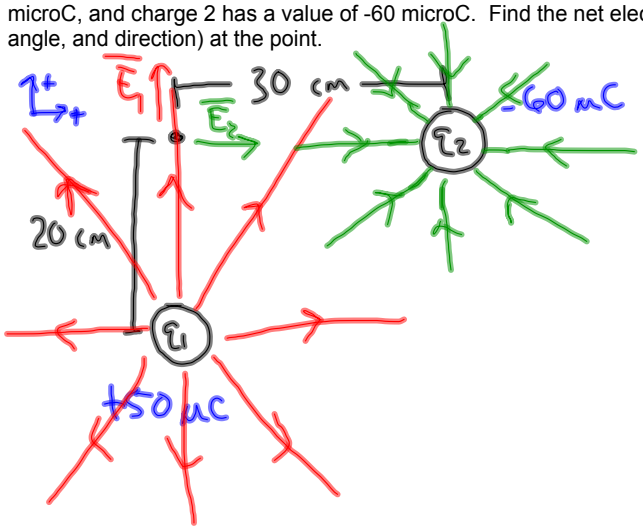
Two charges are arranged with a point in a right triangle. Charge 1 has a value of +50 microC, and charge 2 has a value of -60 microC. Find the net electric field (magnitude, angle, and direction) at the point.



$$\Sigma \bar{E}_x = \bar{E}_{1x}^{\,\emptyset} + \bar{E}_{2x}$$

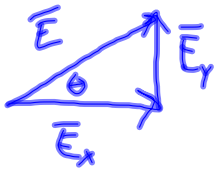
$$= \frac{k|q_2|}{r_2^2} = \frac{(8.99E7\ N\cdot m^2/C^2)(60E{-}6\ C)}{(.3\ m)^2}$$

$$= 6.0E6\ N/C$$

$$\Sigma \bar{E}_y = \bar{E}_{1y} + \bar{E}_{2y}^{\,\emptyset}$$

$$= \frac{k|q_1|}{r_1^2} = \frac{(8.99E7\ N\cdot m^2/C^2)(50E{-}6\ C)}{(.2\ m)^2}$$

$$= 1.1E7\ N/C$$



$E = 1.27E7\ N/C$

$\theta = 28.6°$

N of E